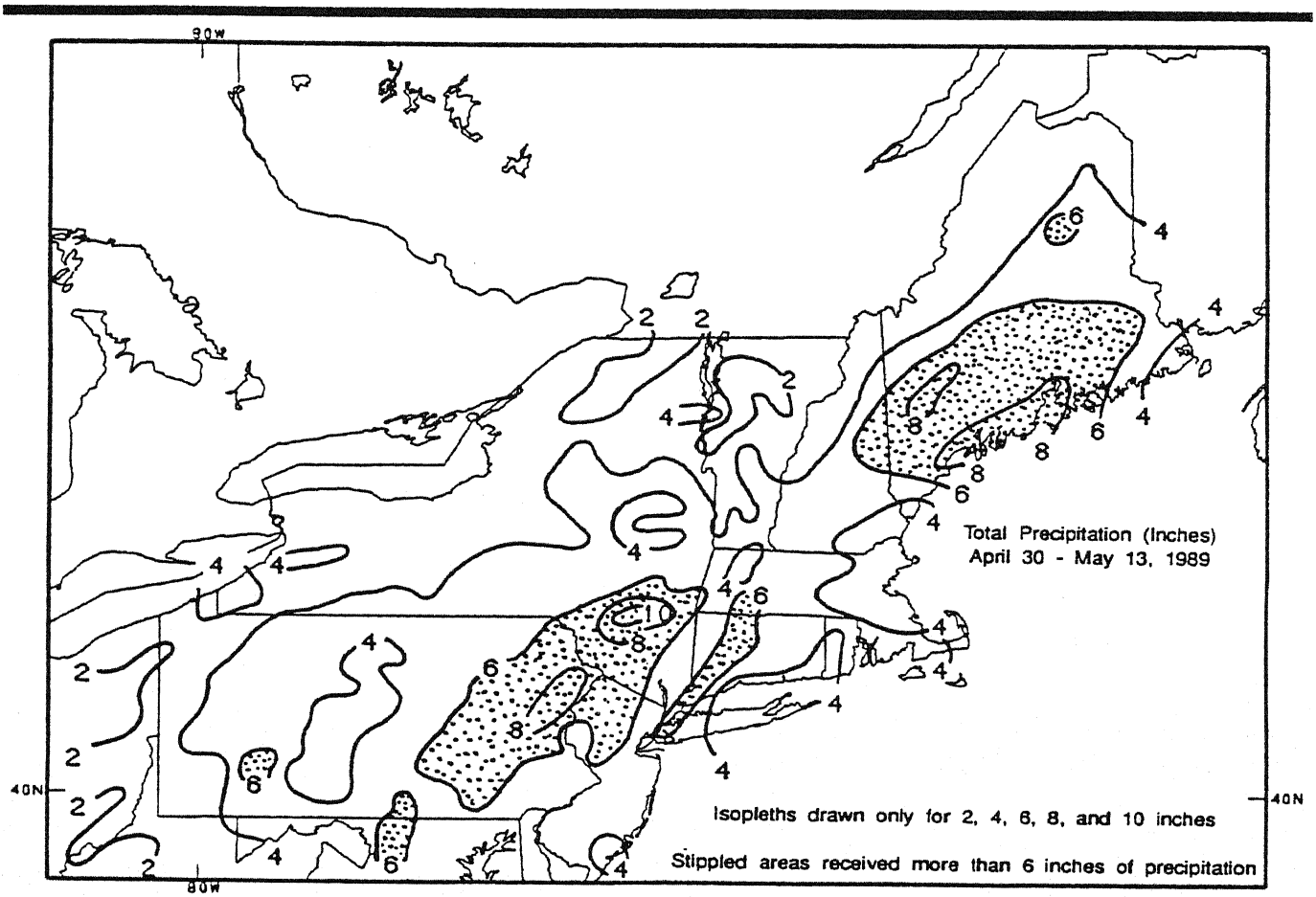
CLIMATE ANALYSIS CENTER

CONTAINS:
SPECIAL ON
DRYNESS IN
SOUTH-CENTRA
CANADA

# WEEKLY CLIMATE BULLETIN

**No. 89/19** **Washington, DC** **May 13, 1989**




*DURING THE PAST TWO WEEKS, MUCH OF THE NORTHEAST HAS BEEN SOAKED WITH UP TO 10.2 INCHES OF RAIN. MANY STATIONS HAVE RECEIVED AS MUCH PRECIPITATION SINCE APRIL 30 THAN THEY DID DURING MARCH AND APRIL 1989 COMBINED. ACCORDING TO THE OFFICE OF HYDROLOGY, CONCERNS ABOUT SUMMER WATER SUPPLY SHORTAGES HAVE BEEN SUBSTANTIALLY ALLEVIATED, WITH MOST RESERVOIRS NOW CONTAINING AT LEAST 75% OF NORMAL CAPACITY COMPARED TO LESS THAN 50% IN EARLY APRIL.*

**UNITED STATES DEPARTMENT OF COMMERCE**
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE - NATIONAL METEOROLOGICAL CENTER

# WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief, concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every 3 months).
- Global three month temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

*Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Center via the Global Telecommunication System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.*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# GLOBAL CLIMATE HIGHLIGHTS

*MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF MAY 13, 1989*

1. Coastal sections of British Columbia and Alaska:

**REGION REMAINS DRY.**

Much below normal precipitation (12 mm or less) was recorded as very dry conditions persisted [12 weeks].

2. Central United States and South Central Canada:

**DRYNESS PERSISTS.**

Little or no precipitation fell in the region as abnormally dry weather continued (See U.S. Weekly Climate Highlights and Special Climate Summary) [8 weeks].

3. Eastern United States:

**COLD, WET WEATHER DOMINATES.**

Up to 130 mm of precipitation, along with temperatures averaging as much as 8°C below normal, prevailed across the east third of the country (see U.S. Weekly Climate Highlights) [2 weeks].

4. Argentina and Uruguay:

**DRYNESS RETURNS.**

Little or no precipitation was reported across the area as dry weather resumed [46 weeks].

5. Turkey:

**DRYNESS CONTINUES; WARMTH ENDS.**

Unseasonably dry conditions persisted in south central Turkey [9 weeks]; however, low temperatures ended the unusually warm weather [Ended at 8 weeks].

6. South Africa:

**WETNESS ENDS.**

The second consecutive week with little or no precipitation ended the abnormally wet conditions in South Africa [Ended at 5 weeks].

7. Eastern Asia:

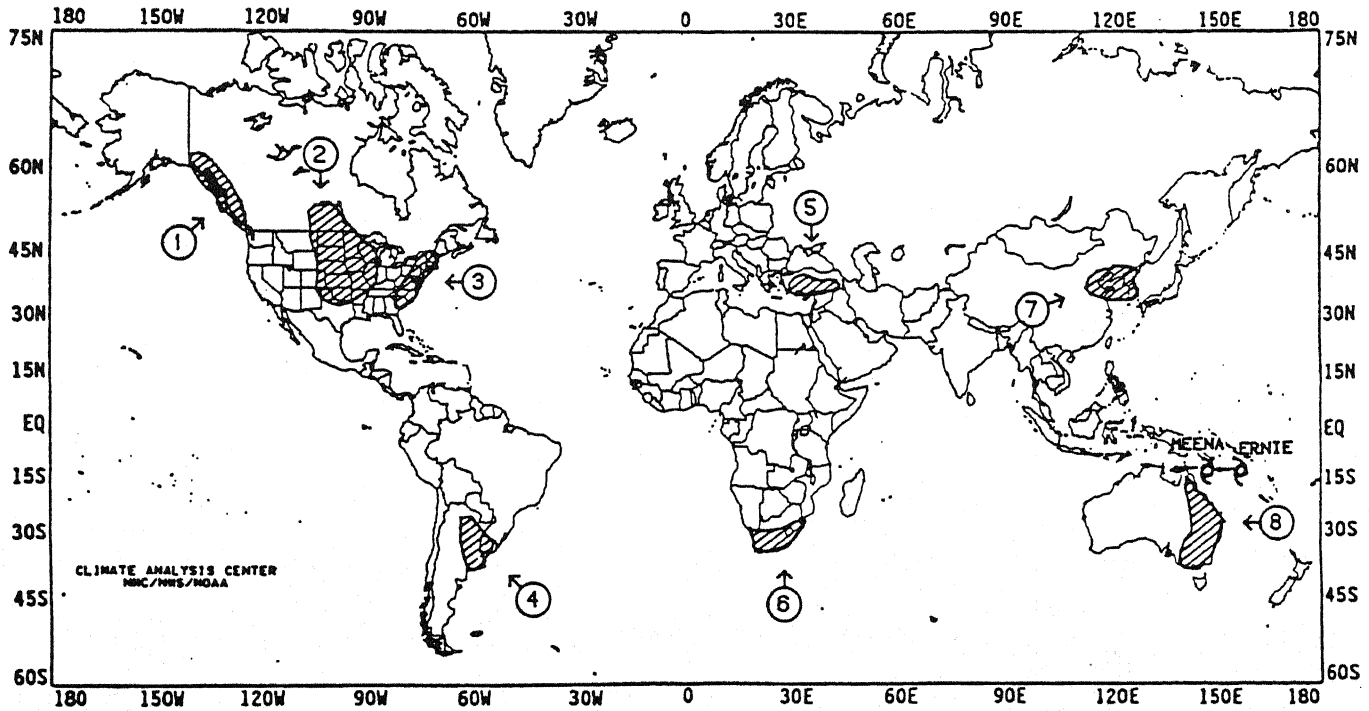
**STILL WARM.**

Above normal temperatures, with departures approaching 4°C, prevailed in Korea and parts of northeastern China [12 weeks], while temperatures returned to near normal in south central Siberia.

8. Eastern Australia:

**MORE RAINS.**

Many stations reported precipitation amounts reaching 81 mm as more wet weather moved into the region [9 weeks].




**EXPLANATION**

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

# UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

*FOR THE WEEK OF MAY 7 THROUGH MAY 13, 1989.*

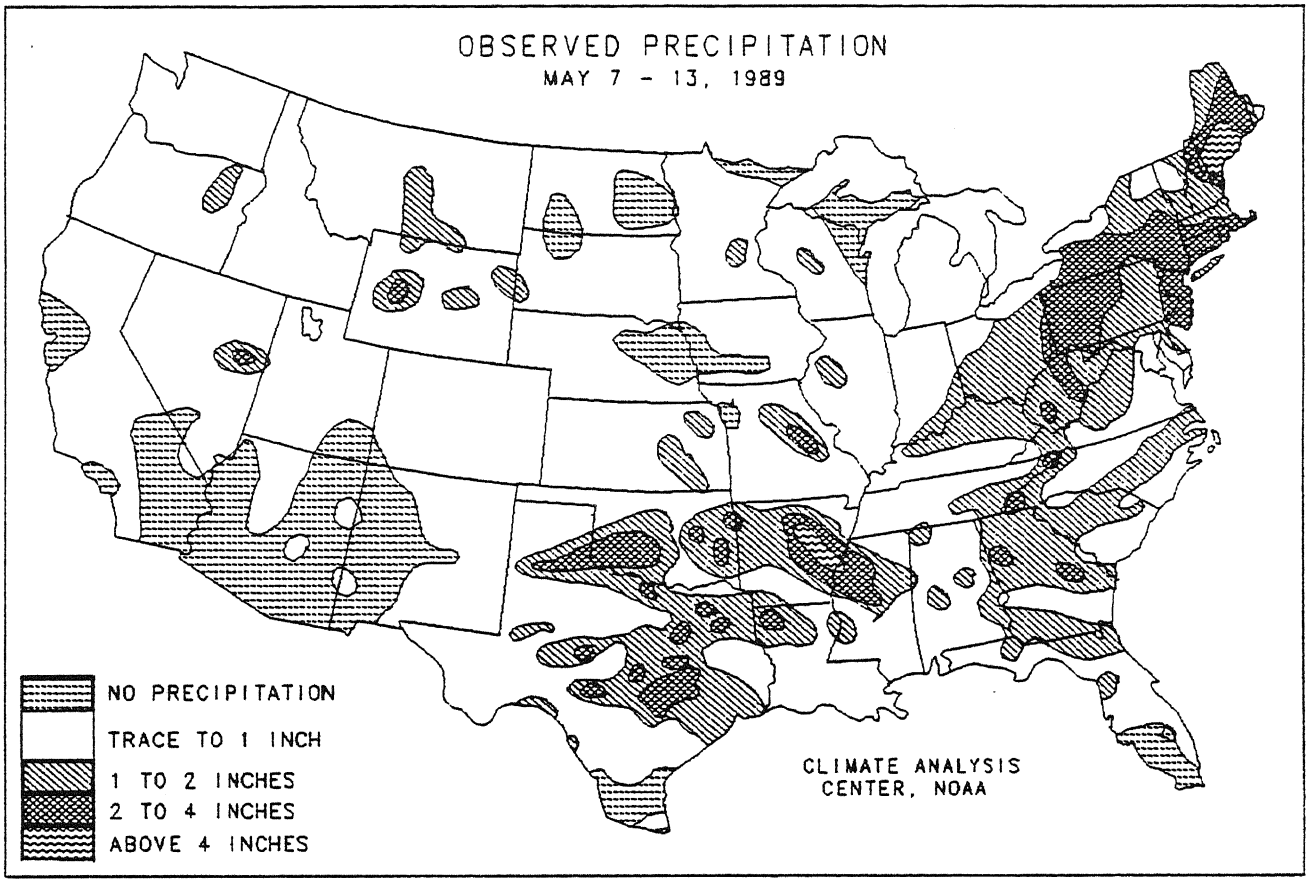
Most of the contiguous United States received some precipitation last week in response to a series of slow-moving storm systems. In the West, an upper-air disturbance and a cold front produced scattered showers throughout most of the region and strong thunderstorms with torrential downpours, damaging winds, and small hail in parts of the northern and central Rockies. Farther east, a stationary front triggered severe weather across portions of the southern and central Great Plains and the lower Mississippi Valley early in the week. Golfball-sized hail was reported at several locations while tornadoes touched down in eastern New Mexico, western Texas, southern Oklahoma, and eastern Arkansas. Severe weather redeveloped in Texas on Friday and Saturday ahead of a warm front as several twisters were spawned. By mid-week, a low pressure center developed over the nation's midsection and tracked eastward to North Carolina, bringing light to moderate rainfall to much of the Southeast and the lower and middle Atlantic Coast. This storm system then moved slowly northward up the Atlantic Coast, dumping moderate to heavy rains on the already-saturated soils of New England and the eastern Great Lakes region. With two straight weeks of heavy precipitation, many areas of the Northeast, especially in the northern Appalachians and the state of Maine, experienced flooding of small streams and rivers; however, the abundant rainfall has brought reservoir levels from critically low to slightly below normal. Earlier in the week, a departing storm system blanketed parts of northern Ohio and western New York with rare May snow as more than 10 inches whitened Rochester, NY on May 7 (the city's greatest one-day snowfall event during the entire 1988-1989 snow season).

For the second consecutive week, significant precipitation fell on most of New England and on sections of the southern Great Plains and lower Mississippi Valley (see Table 1). Since April 30, precipitation totals in the Northeast have exceeded 6 inches across eastern Pennsylvania, southern New York, western Connecticut, and eastern Maine, while some stations in the Blue (ME), Pocono (PA) and Catskill (NY) Mountains have observed more than 8 inches (see front cover). According to the River Forecast Centers, between 2 and 3 inches of precipitation were generally measured at stations throughout New England, while most of southwestern Maine was inundated with up to 5.1 inches of rain. In the southern Great Plains, strong thunderstorms dumped between 2 and 4 inches of rain on south-central Oklahoma and at scattered sites in central and eastern Texas and northern Louisiana. Farther east, portions of eastern Arkansas and northwestern Mississippi recorded up to 5.6 inches. Light to moderate amounts occurred along the Pacific Northwest Coast, in the northern two-thirds of the Intermountain West and Rockies, the southern two-thirds of the Plains, and throughout most of the eastern half of the U.S. Little or no precipitation fell along the southern half of the Pacific Coast, on the southern thirds of the Intermountain West and Rockies, the northern Great Plains, the lower Missouri Valley, the western Great Lakes, and the southern portions of Texas and Florida. Isolated locations along the southeastern coast of Alaska received moderate precipitation; however, most areas observed subnormal precipitation.

Unseasonably cold air persisted across the eastern half of the country as the greatest negative temperature departures (between -11°F and - 14°F) were located in southern New England and the lower and middle Atlantic Coast states (see Table 2). Early in the week, dozens of stations tied or set new daily minimum temperature records in the Midwest and Southeast as a cold dome of high pressure sent lows plunging into the twenties and forties, respectively. Subfreezing temperatures extended as far south as southern Illinois and Indiana and into the southern and central Appalachians (see Figure 1). In sharp contrast, temperatures averaged above normal throughout the western half of the U.S. The greatest positive departures (between +6° and +11°F) occurred in the northern Great Plains, central Arizona, and southern Texas (see Table 3). During the week, several locations tied or set new daily maximum temperature records in sections of the Southwest, the central and southern Great Plains, and Florida. Highs surpassing 90°F were common in the southwestern and south-central U.S., while readings in the one hundreds were reported in the desert Southwest, eastern New Mexico, and western Texas (see Figure 2). Cooler air invaded the Far West towards the end of the week and lowered the magnitude of the positive temperature departures. In Hawaii, seasonable temperatures returned after last week's brief cool spell, while subnormal temperatures covered the northern two-thirds of Alaska.

TABLE 1. Selected stations with 2.00 or more inches of precipitation during the week.

| Station | Total(In) | Station | Total(In) |
|---|---|---|---|
| Portland, ME | 5.09 | Shreveport/Barksdale AFB, LA | 2.44 |
| Mt. Washington, NH | 4.82 | Cordova/Mile 13, AK | 2.42 |
| Brunswick NAS, ME | 4.57 | Hartford, CT | 2.36 |
| Hilo/Lyman, Hawaii, HI | 4.24 | Dubois, PA | 2.28 |
| Augusta, ME | 3.74 | Erie, PA | 2.26 |
| Yakutat, AK | 3.71 | Rochester, NY | 2.20 |
| Buffalo, NY | 2.83 | Chicopee/Westover AFB, MA | 2.20 |
| Millville, NJ | 2.73 | Willow Grove NAS, PA | 2.18 |
| Bradford, PA | 2.67 | Wrightstown/McGuire AFB, NJ | 2.14 |
| Providence, RI | 2.66 | Greenwood, MS | 2.12 |
| Pittsburgh, PA | 2.63 | Binghamton, NY | 2.05 |
| Bangor, ME | 2.58 | Hobart, OK | 2.04 |
| Austin, TX | 2.56 | Williamsport, PA | 2.03 |
| Ft. Sill/Henry Post AAF, OK | 2.54 | Atlantic City, NJ | 2.00 |


OBSERVED PRECIPITATION
MAY 7 - 13, 1989
NO PRECIPITATION
TRACE TO 1 INCH
1 TO 2 INCHES
2 TO 4 INCHES
ABOVE 4 INCHES
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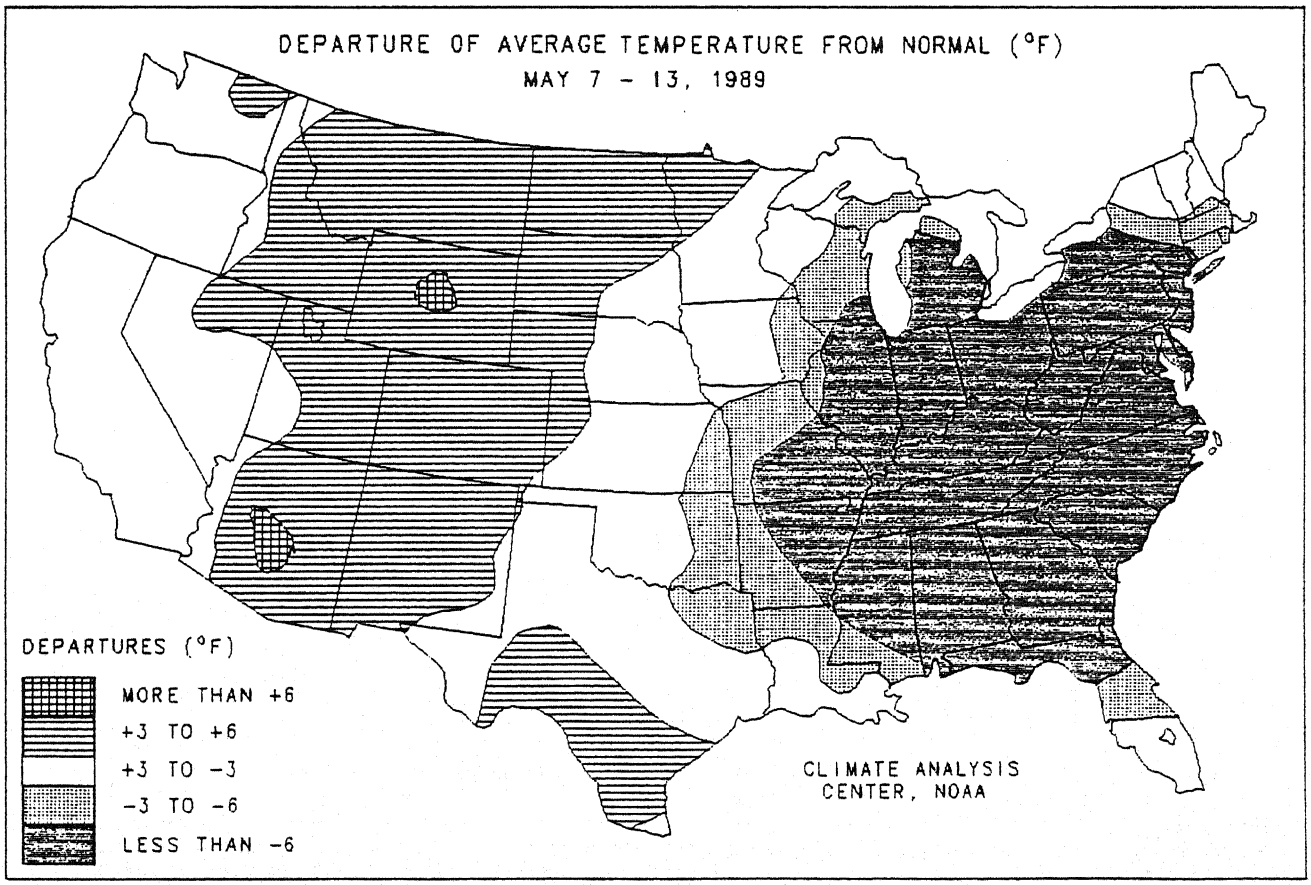

DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)
MAY 7 - 13, 1989
DEPARTURES (°F)
MORE THAN +6
+3 TO +6
+3 TO -3
-3 TO -6
LESS THAN -6
CLIMATE ANALYSIS
CENTER, NOAA

TABLE 2. Selected stations with temperatures averaging 10.0°F or more BELOW normal for the week.

| Station | Degrees F Dep. | Avg. | Station | Degrees F Dep. | Avg. |
|---|---|---|---|---|---|
| Beckley, WV | -14.7 | 43.7 | Raleigh-Durham, NC | -12.0 | 53.6 |
| Bluefield, WV | -14.7 | 44.9 | Columbia, SC | -11.7 | 58.4 |
| Greenville, SC | -14.3 | 53.1 | Columbus, OH | -11.6 | 48.1 |
| Morgantown, WV | -14.0 | 46.0 | Charlotte, NC | -11.6 | 55.4 |
| Charleston, WV | -14.0 | 48.4 | Pittsburgh, PA | -11.5 | 46.4 |
| Elkins, WV | -13.8 | 43.1 | Altoona, PA | -11.3 | 45.5 |
| Greensboro, NC | -13.7 | 51.2 | Goldsboro/Seymour-Johnson AFB,NC | -10.7 | 57.7 |
| Bristol, TN | -13.5 | 49.4 | Dayton, OH | -10.6 | 49.3 |
| Asheville, NC | -13.2 | 48.9 | Lexington, KY | -10.6 | 51.9 |
| Roanoke, VA | -13.2 | 50.2 | Bradford, PA | -10.4 | 40.3 |
| Huntington, WV | -13.1 | 49.9 | Williamsport, PA | -10.4 | 47.4 |
| Parkersburg, WV | -13.0 | 48.9 | Zanesville, OH | -10.4 | 48.3 |
| Hickory, NC | -13.0 | 52.1 | Indianapolis, IN | -10.4 | 50.1 |
| Danville, VA | -12.8 | 53.3 | Athens, GA | -10.4 | 57.6 |
| Jackson, KY | -12.5 | 50.8 | Crossville, TN | -10.3 | 51.5 |
| Anderson, SC | -12.5 | 55.7 | Anniston, AL | -10.2 | 58.4 |
| Lynchburg, VA | -12.4 | 50.7 | Wilmington, NC | -10.0 | 59.4 |
| Knoxville, TN | -12.3 | 53.7 | Augusta, GA | -10.0 | 59.7 |
| Sumter/Shaw AFB, SC | -12.3 | 57.9 | Macon, GA | -10.0 | 61.3 |
| Florence, SC | -12.2 | 57.9 | | | |

TABLE 3. Selected stations with temperatures averaging 6.0°F or more ABOVE normal for the week.

| Station | Degrees F Dep. | Avg. | Station | Degrees F Dep. | Avg. |
|---|---|---|---|---|---|
| Minot, ND | +11.4 | 63.1 | Worland, WY | +7.4 | 60.9 |
| Williston, ND | + 9.7 | 62.3 | Phoenix, AZ | +7.0 | 82.1 |
| Jamestown, ND | + 9.1 | 61.2 | Beeville NAS, TX | +6.9 | 82.6 |
| Grand Forks, ND | + 9.0 | 61.2 | Prescott, AZ | +6.7 | 62.1 |
| Dickinson, ND | + 9.0 | 60.2 | Glasgow, MT | +6.7 | 59.6 |
| Fargo, ND | + 8.3 | 61.7 | Reno, NV | +6.4 | 59.3 |
| Bismarck, ND | + 8.3 | 61.1 | International Falls, MN | +6.0 | 55.1 |

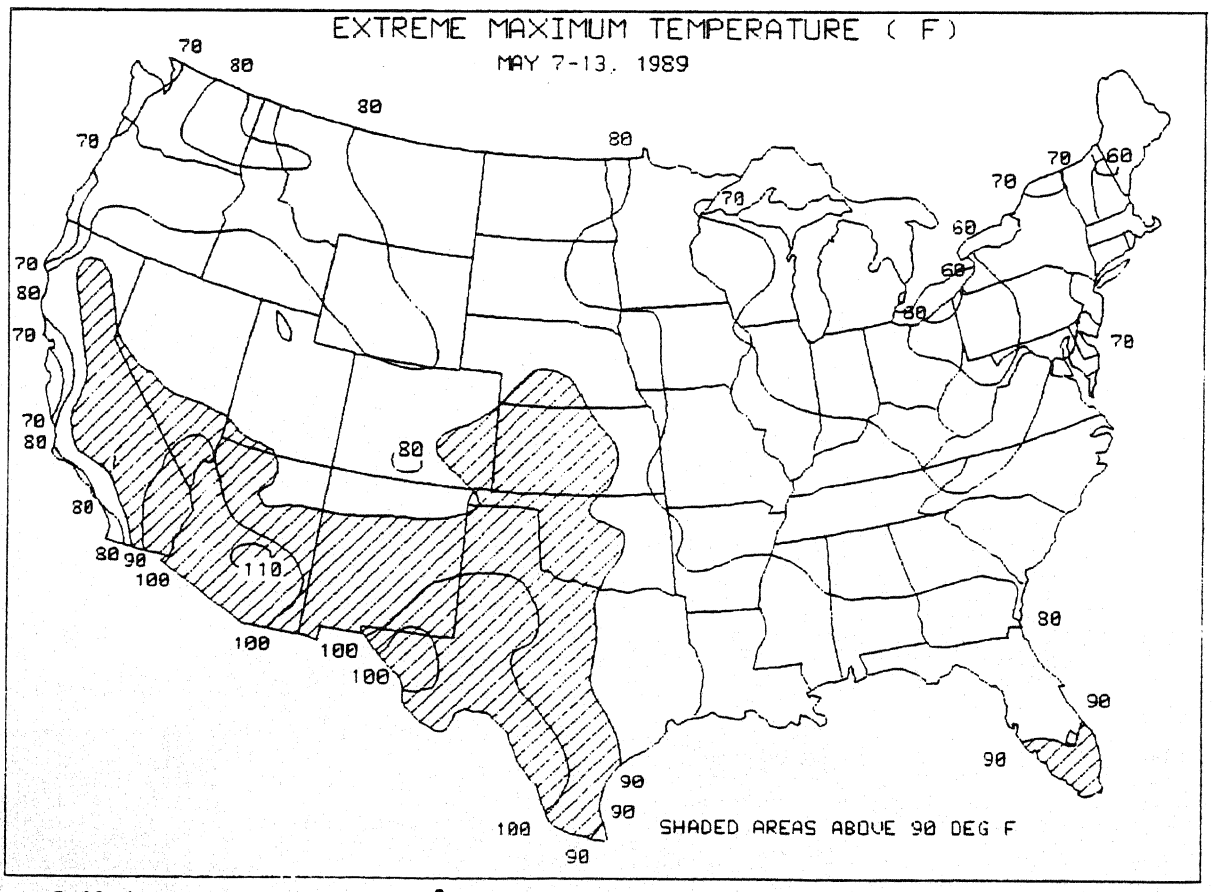



Figure 2. Maximum temperatures over 90°F were common in the southern and central Plains, southern Rockies, and Intermountain West. In contrast, stagnant cool air in the East confined 90°F readings to southern Florida and kept most of the northeastern quarter of the U.S. below 70°F.

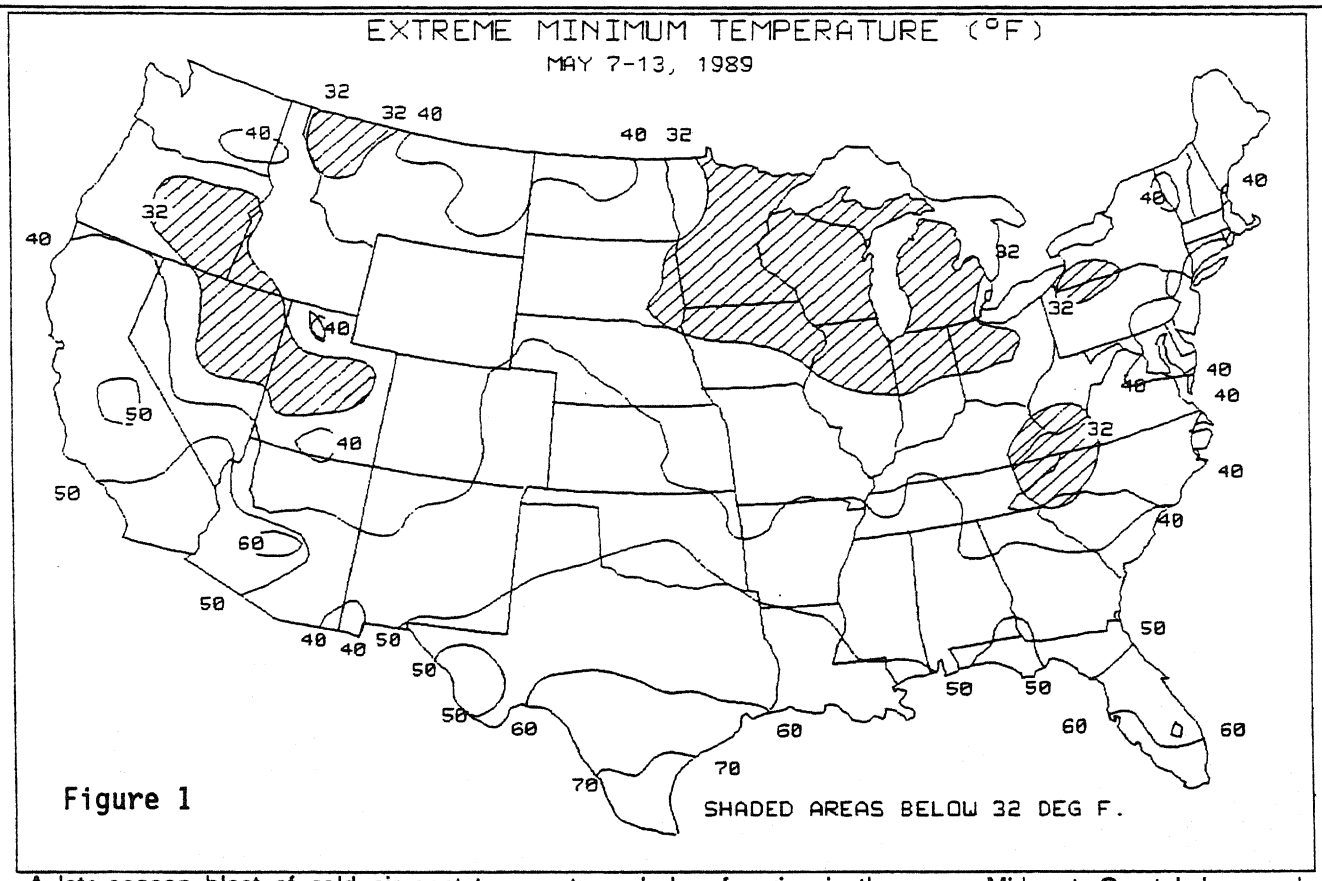
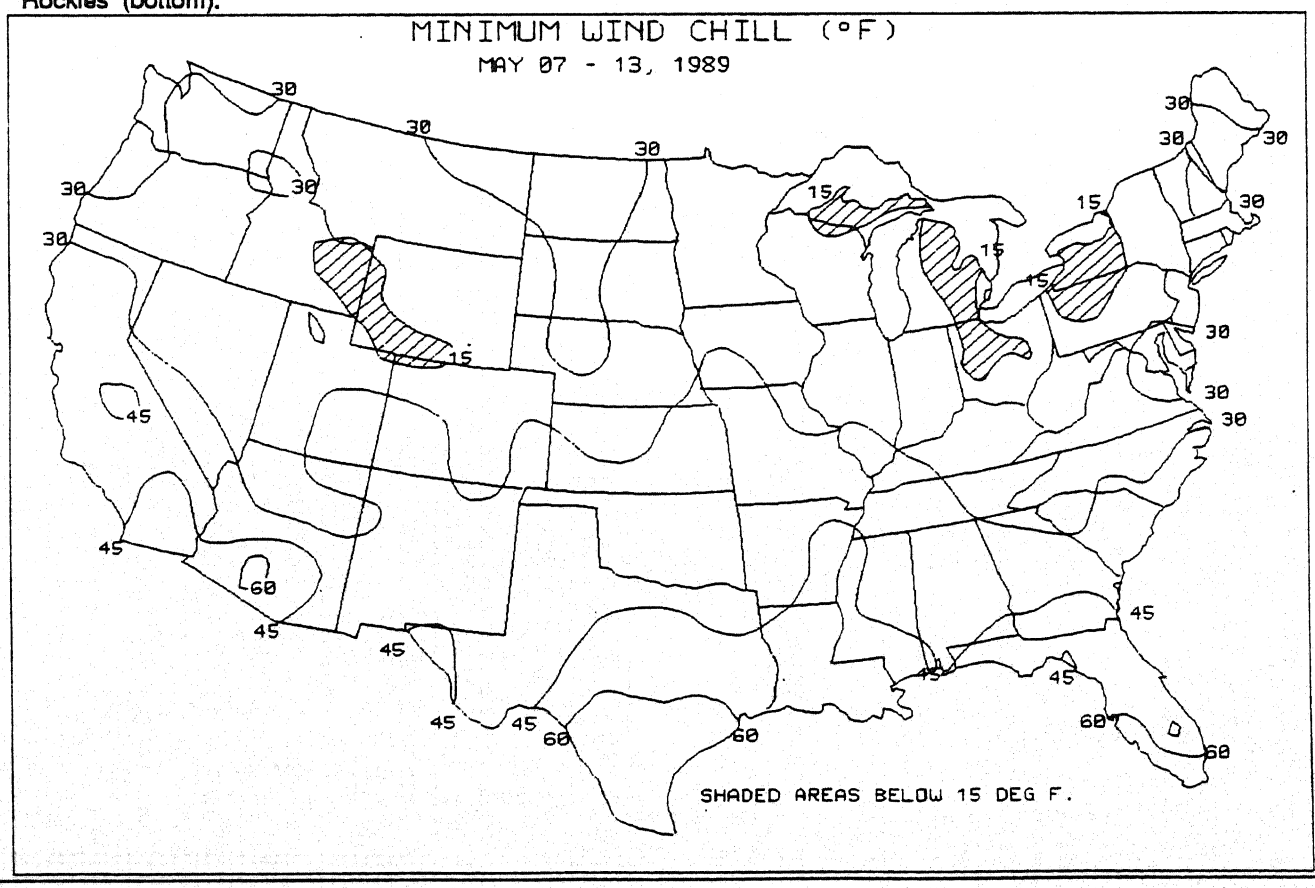
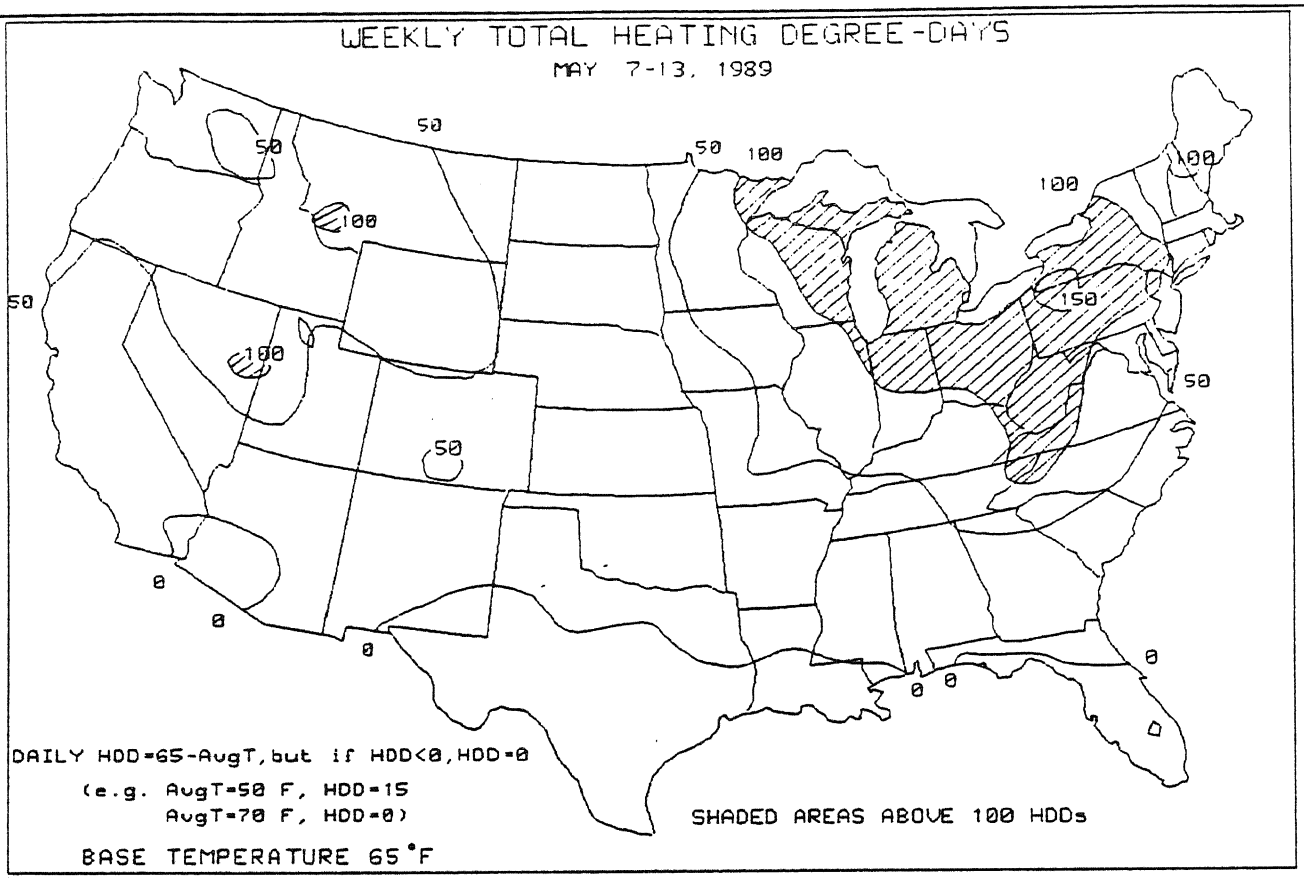


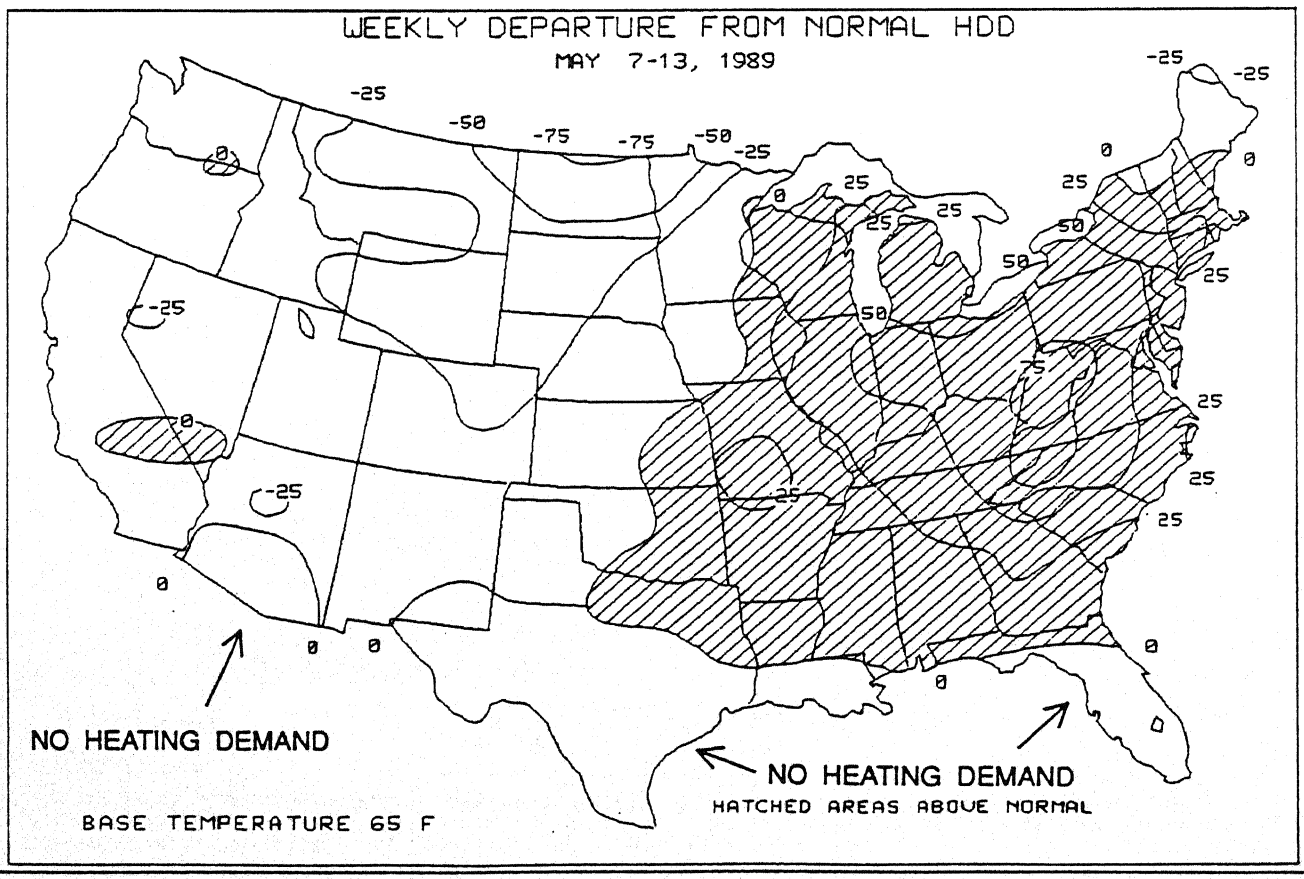

Figure 1

A late-season blast of cold air sent temperatures below freezing in the upper Midwest, Great Lakes, and south-central Appalachians (top). Light winds allowed wind chill readings to remain above 15°F in the East except for parts of the Great Lakes; however, strong winds sent readings below 15°F in parts of the central Rockies (bottom).



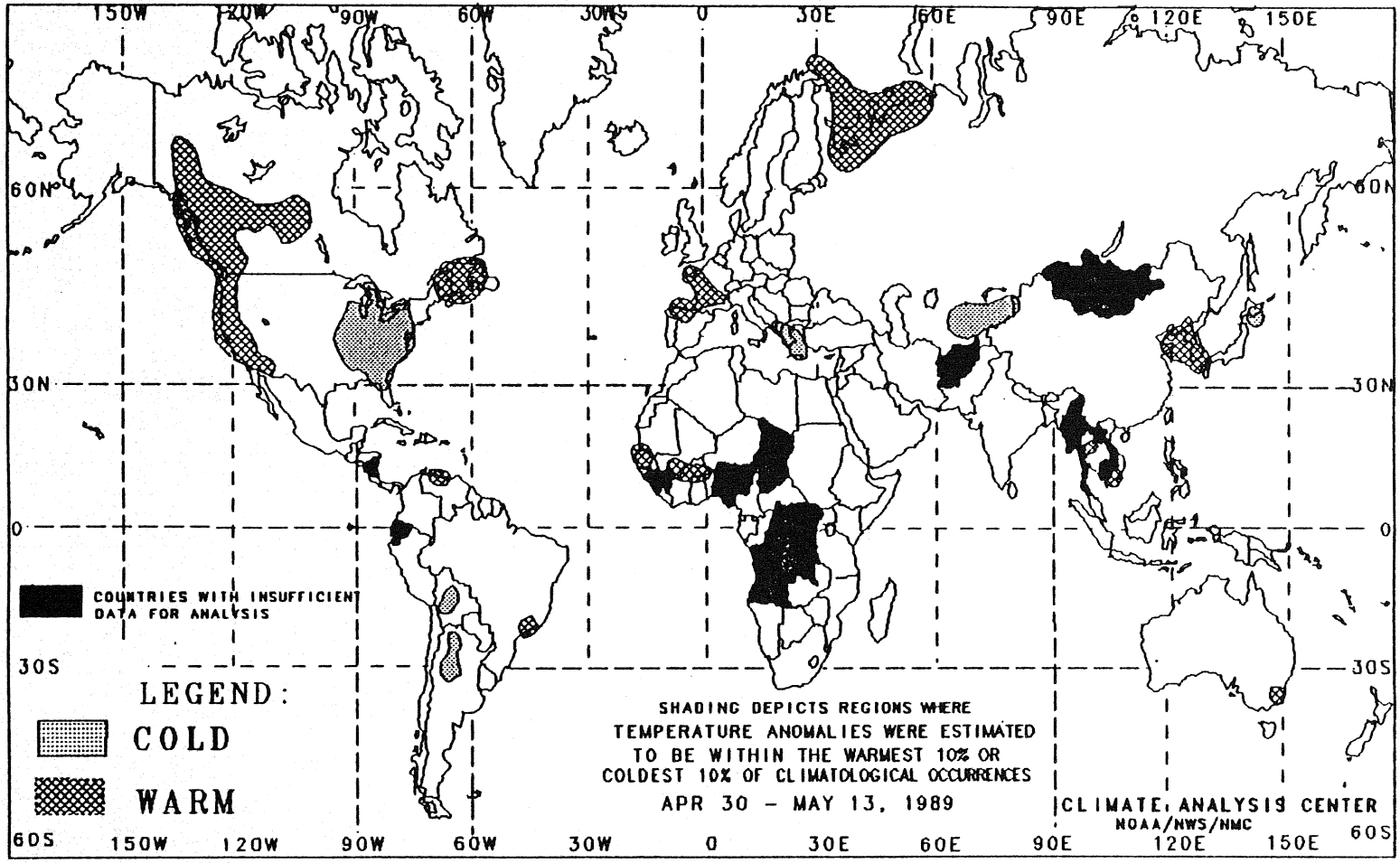



The Great Lakes and Appalachian Mountains recorded total HDDs greater than 100 (top) as the eastern half of the country, with the exception of southern Florida and northern New England, experienced unseasonably cold weather and much above normal heating demand (bottom).



# GLOBAL TEMPERATURE ANOMALIES

*2 WEEKS*




The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

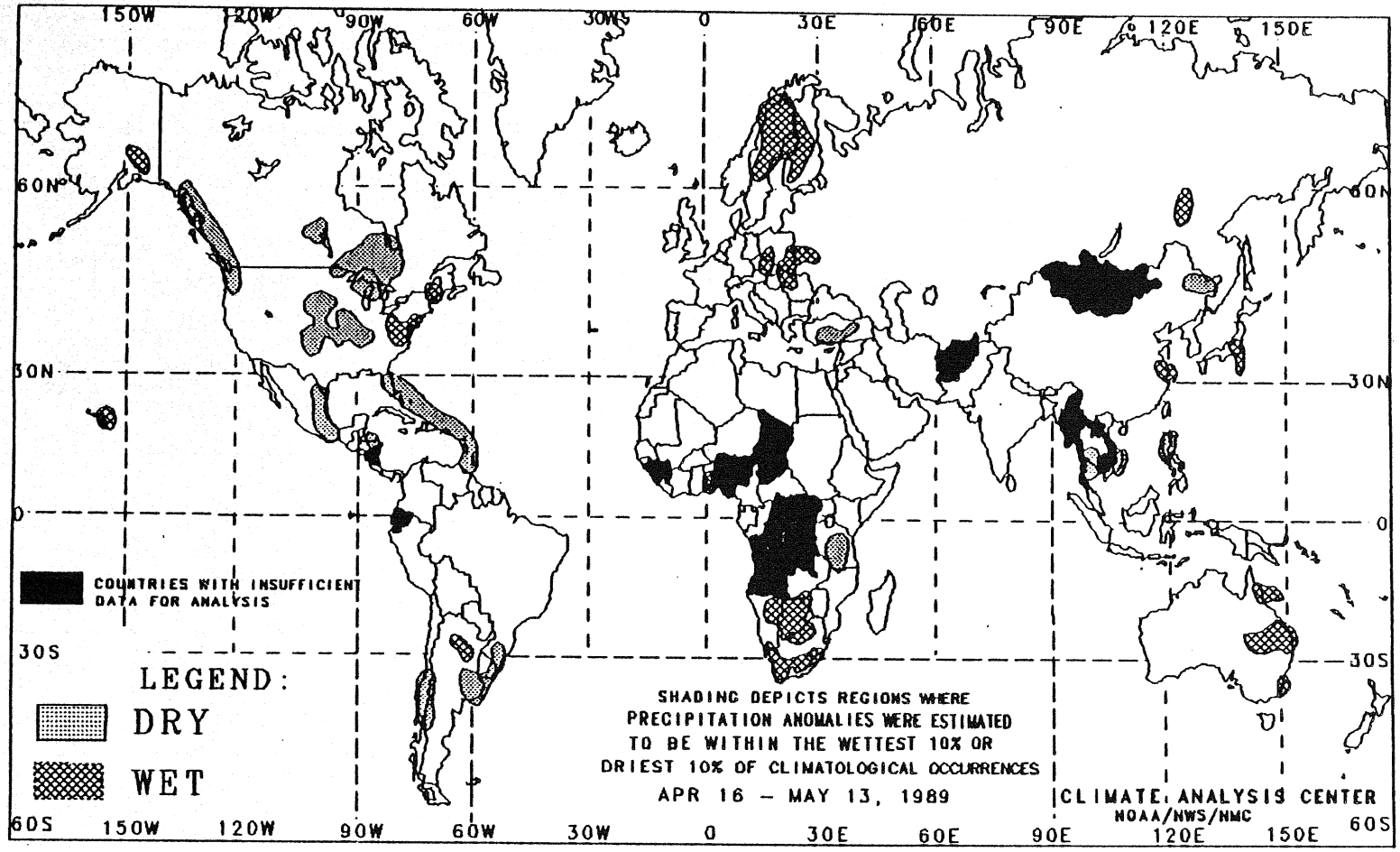
Temperature anomalies are not depicted unless the magnitute of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

# GLOBAL PRECIPITATION ANOMALIES

*4 WEEKS*




The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were recieved or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South Africa, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week predipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

# SPECIAL CLIMATE SUMMARY

*Climate Analysis Center, NMC*
*National Weather Service, NOAA*

## SUBNORMAL PRECIPITATION SINCE OCTOBER 1988 ACROSS MUCH OF CANADA'S CENTRAL PRAIRIES HAS RAISED CONCERN OVER DRYNESS AS THE GROWING SEASON COMMENCES

The United States drought of 1988, the most severe in the Midwest since 1936, afflicted major crop areas that covered over 25% of the lower 48 states as less than half the normal precipitation fell during the critical planting and growing stages from April-June. Similarly in Canada, subnormal precipitation and unseasonably warm weather created unfavorable moisture conditions in the major grain (spring wheat, barley, rapeseed) regions of southern Alberta, most of Saskatchewan, and southwestern Manitoba (see Figure 1). Prior to last year's main growing (May-July) season, much of the region experienced one of the driest November-April periods on record (e.g. only 2 drier periods in 103 years at Calgary, 3 drier periods in 105 years at Edmonton, 1 drier period in 50 years at Estevan, and 2 drier periods in 113 years at Winnipeg), according to the Canadian Climate Center's April 1988 review in the weekly issue of Climatic Perspectives Vol. 10, No. 21. Abnormally dry weather persisted during May 1988; however, ample rains commenced in June and continued into the early fall, providing welcome relief from both short and long-term dryness.

Since last October, below normal precipitation has fallen across much of the Canadian Prairies with the exception of extreme southern Saskatchewan (see Figure 2). Compared with the same time period last year (see Figure 3), this year has a greater areal coverage of stations with subnormal precipitation, but the magnitude of the current precipitation deficits are not as pronounced as they were last year, especially in southern Saskatchewan and the north- central U.S. Precipitation amounts have generally been under 100 mm since October 1988 from northeastern Alberta southeastward to western Manitoba (see Figure 4), allowing deficits of 40-100 mm to accumulate (see Figure 5).

According to the Winnipeg Climate Center, soil recharge from the melting of Prairie snowpack has generally been insufficient to replenish soil moisture reserves, leaving much of the grain belt in need of spring rains (from Climatic Perspectives Vol. 11, No. 16). Since most of the area normally receives the bulk of their annual precipitation during the months of May-July (see Figures 6 and 7), which also parallels the usual growing season, timely and ample precipitation during the next several weeks will be needed to alleviate the current moisture deficiencies and promote favorable growing conditions for Canada's grain crops.

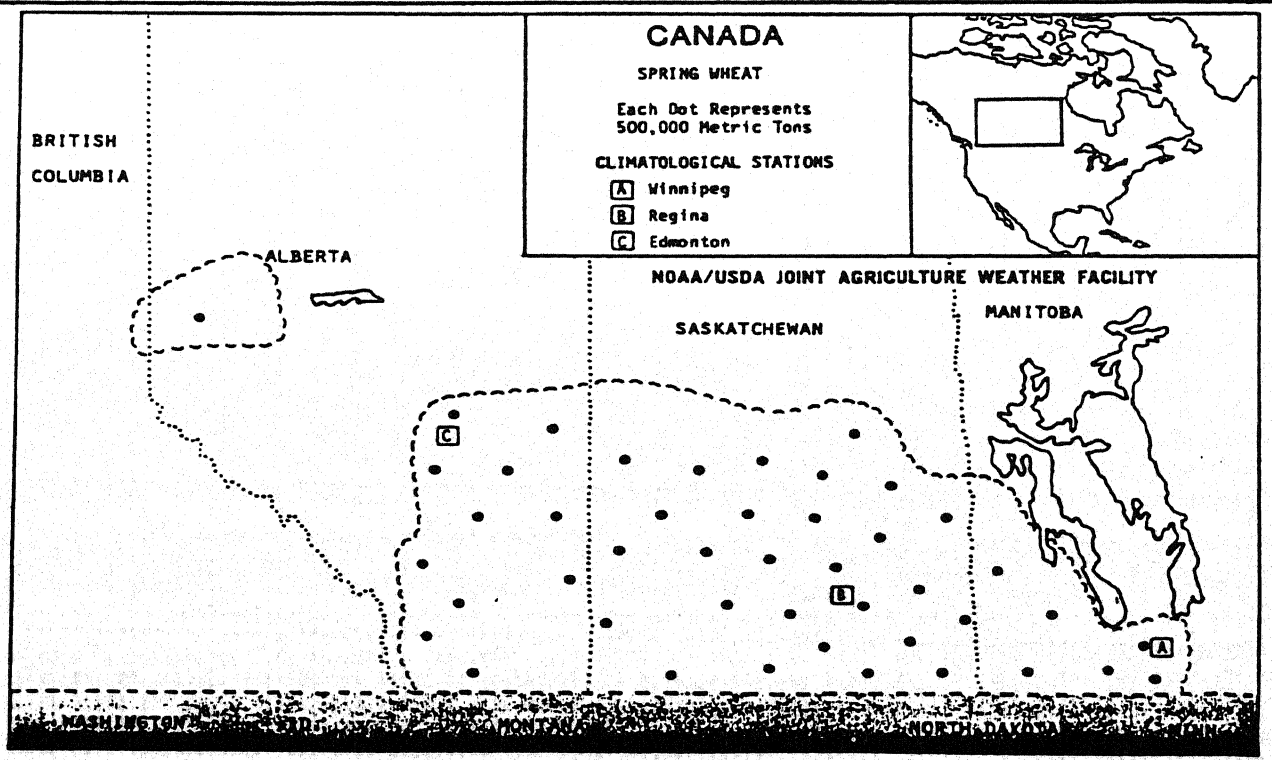



Figure 1. Approximate location of Canadian spring wheat (and barley and rapeseed) crop. Information taken from the United States Department of Agriculture's "Major World Crop Areas and Climatic Profiles", the Agriculture Handbook No. 664 revised September 1987, pages 124-125.

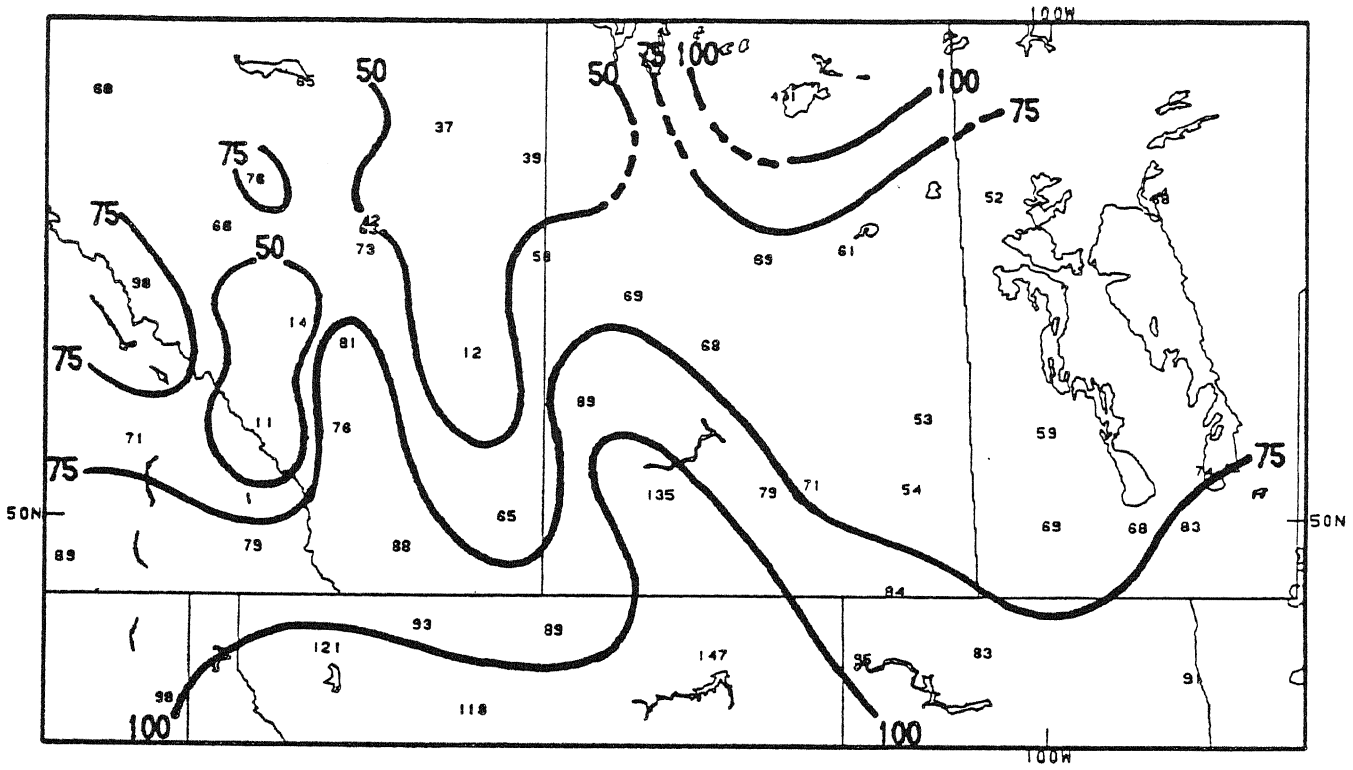



Figure 2. Percent of normal precipitation during October 1, 1988-May 13, 1989 (225 days). Isopleths are only drawn for 50, 75, and 100%, and a station was included only if 90% (202 days) or more of the days were available. Most of the Canadian Prairie states have recorded subnormal precipitation during the past 7 1/2 months.

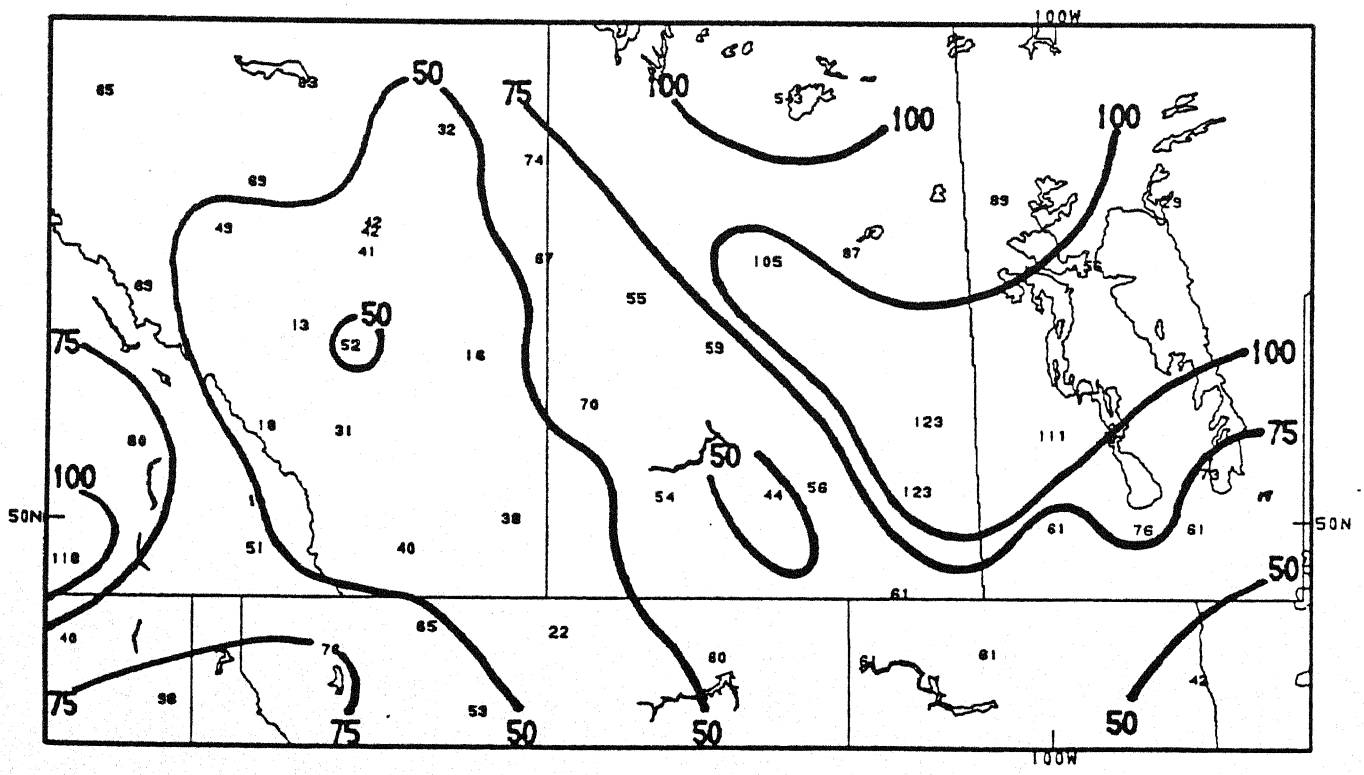



Figure 3. Percent of normal precipitation during October 1, 1987-May 13, 1988 (226 days). Isopleths are only drawn for 50, 75, and 100%, and a station was included only if 90% (203 days) or more of the days were available. While parts of eastern Saskatchewan and central Manitoba recorded surplus precipitation, extreme dryness plagued most of Alberta, western Saskatchewan, southern Manitoba, and the north-central U.S. prior to the 1988 growing season.

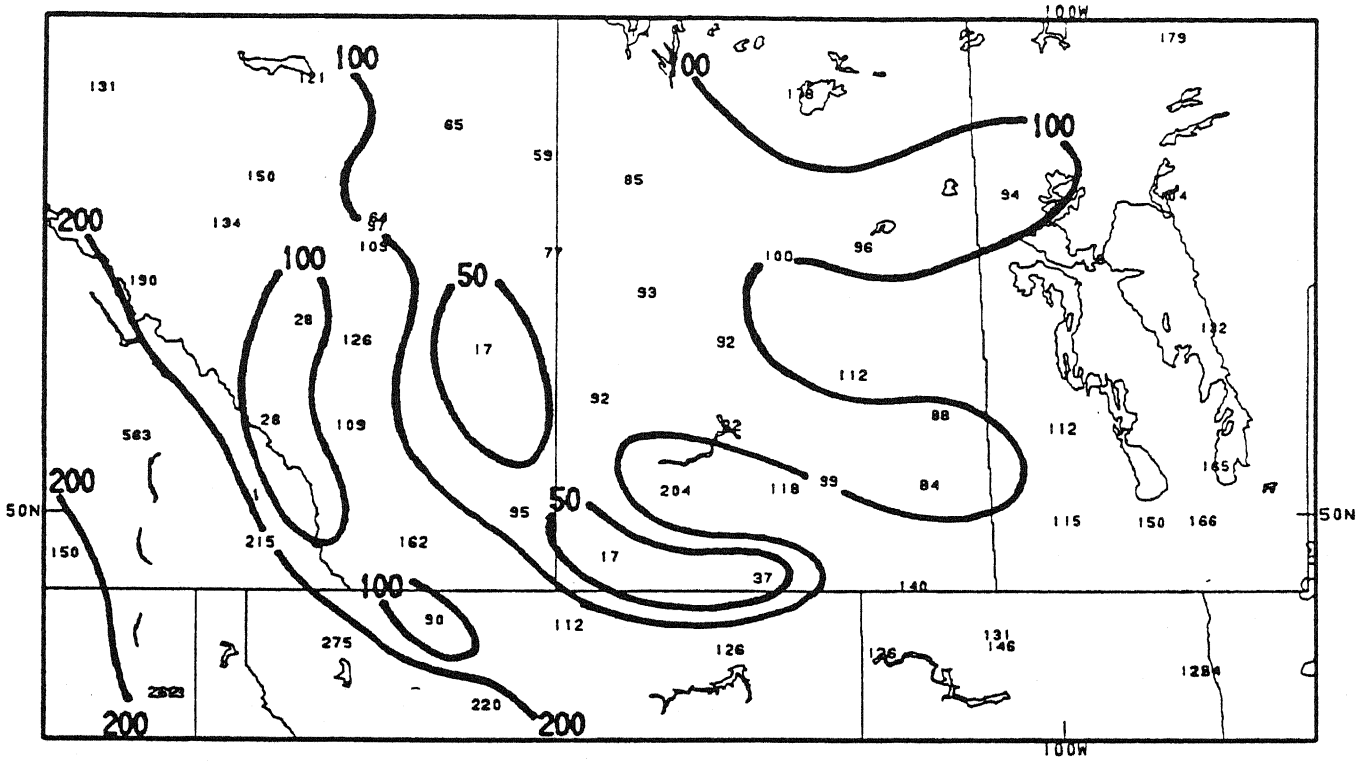



Figure 4. Total precipitation (mm) during October 1, 1988-May 13, 1989 (225 days). Isopleths are drawn only for 50, 100, and 200 mm, and a station was included only if 90% (202 days) or more of the days were available. Generally less than 100 mm has fallen across most of Saskatchewan and eastern Alberta during the past 7 1/2 months.

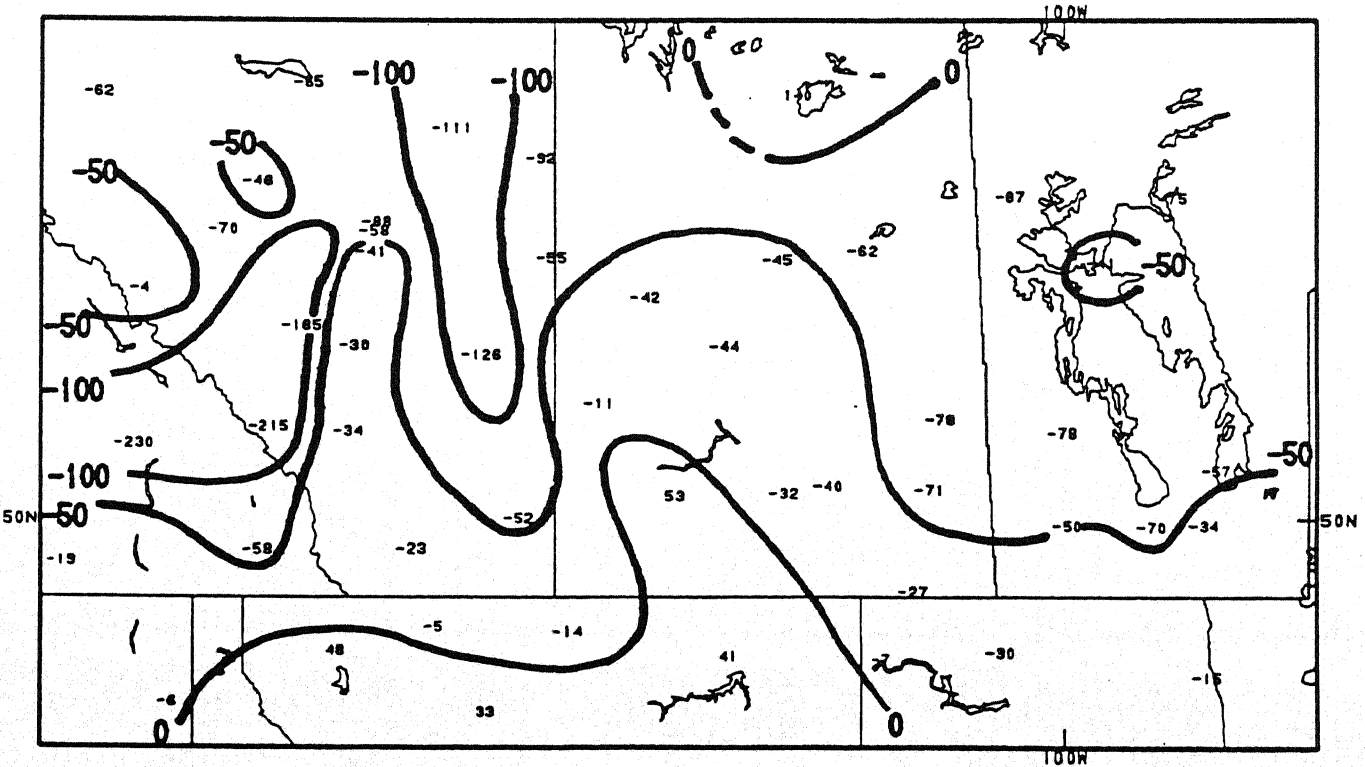



Figure 5. Departure from normal precipitation (mm) during October 1, 1988-May 13, 1989 (225 days). Isopleths are only drawn for 0, -50, and -100 mm, and a station was only included if 90% (202 days) or more of the days were available. Deficits of 40-100 mm have accumulated across western Manitoba, central Saskatchewan, and western Manitoba since last October.

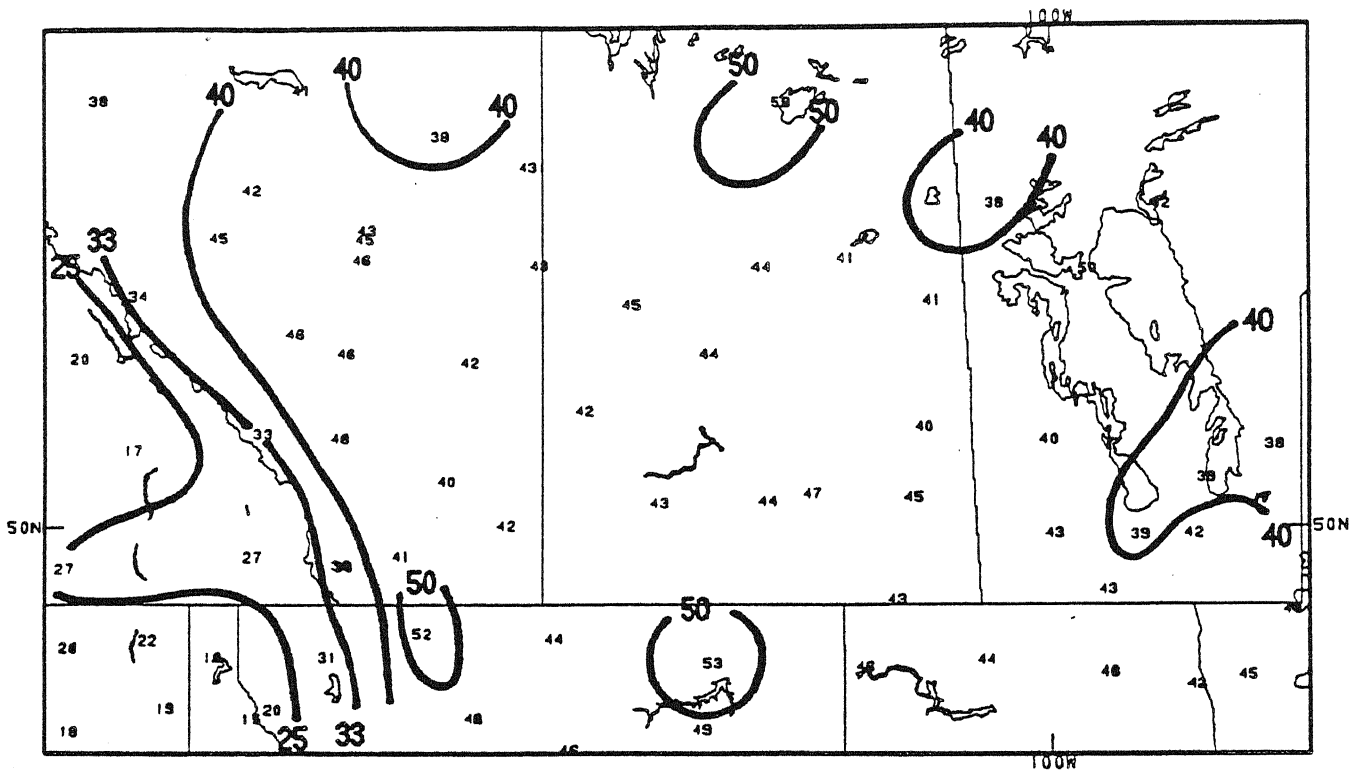



Figure 6. Percent of the annual precipitation that normally occurs during May- July. A station with equally-distributed monthly precipitation would have 25% (3/12) of the annual precipitation during any 3 month period. Isopleths are only drawn for 25, 33, 40, and 50%. Most of south-central Canada usually receives almost half of the normal annual precipitation during May-July.

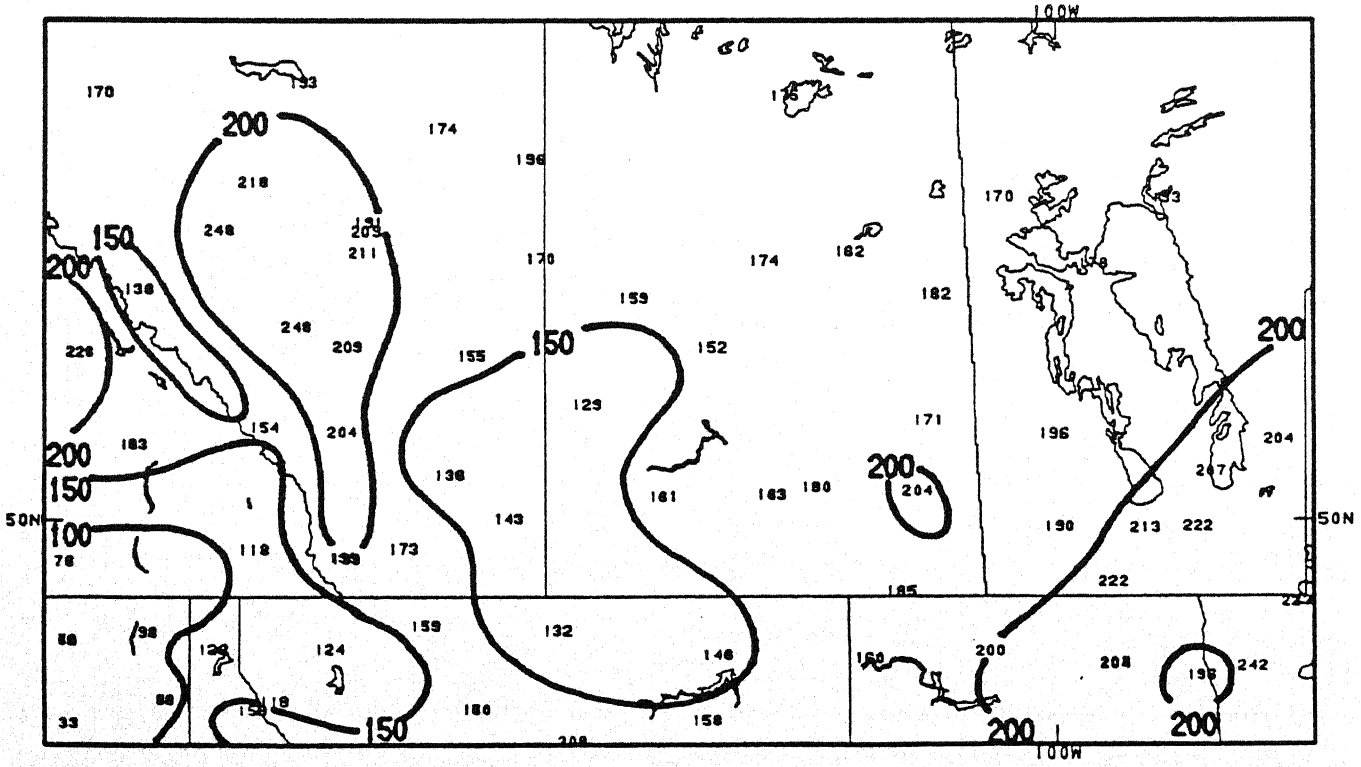



Figure 7. Total normal precipitation (mm) during May-July. The normal May-July precipitation, generally between 150-200 mm, accounts for almost half of the normal annual precipitation in the Canadian Grain Belt.